REMARKS

Reconsideration of the present application is respectfully requested in view of the following remarks. Prior to entry of this response, Claims 1-6 were pending in the application, of which Claims 1 and 4 are independent. In the final Office Action dated May 7, 2003, Claims 1-6 were rejected under 35 U.S.C. §103(a) and the drawings were objected to. Following this response, Claims 1-6 remain in this application. Applicant hereby addresses the Examiner's rejections in turn.

I. Objection to the Drawings

In the final Office Action dated May 7, 2003, the Examiner objected to the drawings stating that FIG. 3 should be designated --Prior Art-- because only that which is old is illustrated. Though the basic structure of the FIG. 1 ion source embodiment is similar to the conventional device shown in FIG. 3, the device of FIG. 3 at least is not set up to satisfy $L < 3.37B^{-1}\sqrt{(V_A)} \times 10^{-6}$. (*See* page 7, lines 12-23 of the specification.) At least for this reason, FIG. 1 and FIG. 3 are not identical as suggested by the Examiner. In order to further prosecution, however, subject to the approval of the Examiner, a substitute FIG. 3 is submitted designating FIG. 3 as --Prior Art-- in red. Applicant respectfully submits that substitute FIG. 3. overcomes this objection and adds no new matter.

II. Rejection of the Claims Under 35 U.S.C. § 103(a)

In the final Office Action, the Examiner rejected Claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,554,852 ("*Bright*") in view of U.S.

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Patent No. 6,037,717 ("*Maishev*"). Claims 1 and 4 have been amended to further define and clarify the invention, and Applicant respectfully submits that the amendment overcomes this rejection and adds no new matter.

Amended Claim 1 is patentably distinguishable over the cited art in that it recites, for example, an ion source comprising a plasma production vessel which serves as an anode, a filament provided on one side of said plasma production vessel, a reflector provided opposite said filament on the other side of said plasma production vessel and kept at a filament potential or a floating potential, and a magnet for generating a magnetic field in a direction of connecting said filament and said reflector within said plasma production vessel, wherein a relation $L < 3.37B^{-1}\sqrt{(V_A)} \times 10^{-6}$ is satisfied, where the arc voltage applied between said plasma production vessel and said filament is V_A[V], the magnetic flux density of the magnetic field within said plasma production vessel is B[T], and the shortest distance from a most frequent electron emission point located almost at the tip center of said filament to a wall face of the plasma production vessel is L[m], wherein the magnetic field is configured to cause electrons produced by the plasma production vessel above an energy level to collide with the wall face.

Moreover, amended Claim 4 is patentably distinguishable over the cited art in that it recites, for example, a method for operating an ion source which comprises a plasma production vessel serving as an anode, a filament provided on one side of said plasma production vessel, a reflector provided opposite said filament on the other side of said plasma production vessel and kept at a filament potential or a floating potential, and a magnet for generating a magnetic field in a direction of connecting said filament and said reflector within said plasma production vessel, the method comprising a step of

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leading out an ion beam with the following relation being satisfied, $L < 3.37B^{-1}\sqrt{(V_A)} \times 10^{-6}$ where an arc voltage applied between said plasma production vessel and said filament is V_A[V], a magnetic flux density of the magnetic field within said plasma production vessel is B[T], and a shortest distance from a most frequent electron emission point located almost at the tip center of said filament to a wall face of said plasma production vessel is L[m], wherein the magnetic field is configured to cause electrons produced by the plasma production vessel above an energy level to collide with the wall face.

In contrast with amended Claims 1 and 4, and as admitted by the Examiner, Applicant submits that *Bright* at least does not teach or suggest, for example, a magnet for generating a magnetic field in a direction of connecting said filament and said reflector within said plasma production vessel, wherein a relation $L < 3.37B^{-1}\sqrt{(V_A)} \times 10^{-6}$ is satisfied. Applicant further submits that because *Bright* does not teach or suggest the aforementioned magnetic field, it cannot teach or suggest the magnetic field configured to cause electrons produced by the plasma production vessel above an energy level to collide with the wall face.

Furthermore, *Maishev* does not overcome *Bright's* deficiencies. *Maishev* merely discloses electrons held in cross electric and magnetic fields of such a magnitude at which the Larmor radius of an electron (re) is approximately equal to an anode-cathode distance (d), whereas the Larmor radius of an ion (ri) significantly exceeds distance "d". (*See Maishev*, column 6, line 67 through column 7, line 3.) *Maishev* at least does not teach or suggest a magnetic field configured to cause electrons produced by a plasma

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production vessel above an energy level to collide with a wall face, rather, *Maishev* merely discloses a general observation regarding magnetic fields.

Combining *Bright* with *Maishev* would not have led to the claimed invention because *Bright* and *Maishev,* either individually or in combination, at least do not disclose or suggest that the magnetic field is configured to cause electrons produced by the plasma production vessel above an energy level to collide with the wall face, as recited by amended Claims 1 and 4. Accordingly, independent Claims 1 and 4 patentably distinguish the present invention over the cited art, and Applicant respectfully requests withdrawal of this rejection of Claims 1 and 4.

Dependent Claims 2-3 and 5-6 are also allowable at least for the reasons above regarding independent Claims 1 and 4 , and by virtue of their respective dependencies upon independent Claims 1 and 4. Accordingly, Applicant respectfully requests withdrawal of this rejection of dependent Claims 2-3 and 5-6.

III. Conclusion

Applicants respectfully requests that this Amendment After Final be entered by the Examiner, placing the claims in condition for allowance. Applicant respectfully submits that the proposed amendments of the claims do not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

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Finally, Applicant respectfully submits that the entry of the Amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicant respectfully submits that the claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicant therefore requests the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

In view of the foregoing, Applicant respectfully submits that the pending claims, as amended, are patentable over the cited references. The preceding arguments are based only on the arguments in the Official Action, and therefore do not address patentable aspects of the invention that were not addressed by the Examiner in the Official Action. The claims may include other elements that are not shown, taught, or suggested by the cited art. Accordingly, the preceding argument in favor of patentability is advanced without prejudice to other bases of patentability.

Please grant any extensions of time required to enter this amendment and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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